March 6, 1955

Dr. J. G. Ross
Dept. Agronomy
So. Dakota State College
College Station, S.D.

Dear Dr. Ross:

I have been following your reports on genetic effects of colchicine on Sorghum with some interest. This is now only slightly more acute as I am starting to prepare a monograph on "genetics and chemotherapy" and may try to include some comment on diverse genetic effects of chemical agents such as colchicine. Unfortunately, my interest is not matched by my information. There are several points that may very well be presented in your papers, but I may have overlooked or failed to assimilate. Would you, as a sort of personal favor be willing to answer some questions? I would also be in your debt if youncould send me your reprints as well.

Ross, J. G.

First of all, I am not entirely clear as to the overall design. I gather that a number of plants were treated, others left alone, and that these were then selfed. Altogether, how many runs have there been? How many U and C plants have been subsequently followed? Do the conditions of treatment preclude any possibility of "introgression"?— or have you some specific markers that would serve this end? If the experiment has been repeated, how reproducible is the result? Are the mutants picked up in C_1 possibly the result of selfing of heterozygous mutants, or are they too prevalent already in C_1?

The second question concerns the genetic analysis. I gather that your cytological studies of hybrids now rule out the likelihood that the mutants represent new karyotypes. Is it possible, however, that there are two chromosome pairs (say A_1A_1 A_2 A_2) in the standard, such that A_1 and A_2 already show considerable homology, so that the mutants might be A_1-tetrasomic, A_2-nullisomic? I did not notice any segregations from backcross hybrids— has there been a second backcross generation to verify that recessive mutation(s) are involved? If not, would it be worth while considering the possibility that the manifold effects are cytoplasmic, in which case the next generations from reciprocal backcrosses would differ?

I hope these points do not seem unduly naive; I can only apologize for them by the fact that my own special material is somewhat far afield from crop plants.

With best regards.

Yours sincerely,

Joshua Lederberg
Professor of Genetics